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ORIGINAL PAPER

Mental and physical health of Kosovar Albanians in their place of origin: a post-war 6-year follow-up study

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Abstract
Purpose Long-term outcome of traumatic experiences among war-exposed civilians living in their home country has been seldom documented. The present study examined change in posttraumatic stress disorder (PTSD) frequency and perceived physical and mental health in a cohort of Kosovar Albanians over 6 years (2001–2007).
Methods Of 996 Albanian Kosovar civilians included in the 2001 survey, 551 subjects (55.3%) were recalled and interviewed in 2007. Diagnoses of PTSD and major depressive episode were assessed using the Mini International Neuropsychiatric Interview. Subjective physical and mental health were investigated using the Medical Outcomes Study 36-Item Short-Form (SF-36). A list of traumatic events adapted from the Harvard Trauma Questionnaire and other stressful life events was also considered.
Results Posttraumatic stress disorder was significantly less frequent in 2007 than in 2001 (14.5% vs. 23.2%, $p < 0.001$). For 18.0, 5.3 and 9.3% of participants, PTSD remitted, persisted and developed over the 6-year follow-up period, respectively. Ill health without having access to medical care and major changes in responsibilities at work were associated with both persistence and new occurrence of PTSD. While the SF-36 mental component summary score significantly improved (mean change +4.5, $p < 0.001$), the physical component summary score did not change between 2001 and 2007, after adjustment for age (mean change −0.8, $p = 0.14$).
Conclusions Results point at the importance of economic and health system reconstruction programs with respect to public health in post-conflict countries.

Keywords Posttraumatic stress disorder · Kosovo · War · Trauma · Perceived health

Introduction

Most studies on the mental health of civilian populations affected by war have focused on the impact of traumatic events shortly after armed conflicts and in displaced people, either in refugee camps or in countries of asylum. Longitudinal health surveys in post-conflict countries were rarely conducted. Therefore, despite numerous publications on the consequences of psychic trauma worldwide, there is little data on the long-term determinants of mental health in traumatized populations living in their home countries or places of origin several years after the end of war. Moreover, few studies have examined psychological disorders other than posttraumatic stress disorder (PTSD) and even fewer have taken into account the physical and mental dimensions of health, even though these two components are closely related in such contexts [1]. Kosovo is no exception. As in most other post-conflict settings, mental health assessments and interventions were conducted on a short-term basis, with

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a serious lack of follow-up information [2]. Epidemiological studies have been limited by their cross-sectional design, both in Kosovo and in the wider Balkans region.

Three point prevalence studies conducted in Kosovo, using various methods and instruments, reported a 89.5% rate of posttraumatic stress symptoms in 2001 [3], whereas PTSD frequency was 17.1% in 1999 [4] and 23.5% in 2001 [5]. A later cross-sectional study in 2006 showed rates of 26.4% for PTSD and 41.4% for major depression, using the Mini International Neuropsychiatric Interview (MINI) [6]. Cross-sectional studies in Kosovo also demonstrated the importance of experiential avoidance for understanding war-related psychological distress [7] and reported a high prevalence of symptoms of somatization (between 24 and 42%), associated with altered relationships and systems of meaning among civilians [8]. Another cross-sectional study showed that one in eight Kosovar civilian war survivors met criteria for somatic distress, measured with the somatic complaints subscale of the Patient Health Questionnaire (PHQ) [9].

Other studies involving Kosovar Albanians focused either on the mental health of refugees abroad, for example in the US where PTSD rate was estimated at 60.5% in a sample of 129 refugees [10] and in Switzerland where 27% of 319 asylum seekers from Kosovo presented PTSD symptoms [11], or on specific psychotherapeutic interventions such as mind–body skills groups for adolescents [12], family based mental health programs [13], or multi-family group interventions [14].

For the wider Balkans region, most studies involved people locally displaced [15–17] or resettled in countries of asylum [18, 19], or considered a cross-sectional design. An example is the survey by Basoglu et al. [20] who investigated the impact of lack of redress upon posttraumatic stress reactions in former Yugoslavia. A multicenter survey conducted between 2005 and 2006 in five war-affected countries of former Yugoslavia showed that prevalence rates were 15.6–41.8% for anxiety disorders and 12.1–47.6% for mood disorders [21]. For both diagnostic categories, the highest rates were observed in Kosovo. According to the authors, this may reflect a cumulative effect of particular socioeconomic hardship and long-lasting interethnic tensions in Kosovo. Globally, higher levels of traumatic experiences during and after the war were linked to higher rates of anxiety and mood disorders [21]. In a sample of 264 subjects from former Yugoslavia living in Croatia, Serbia, Germany, and the United Kingdom, PTSD was shown to persist in 83.7% of participants after an average 11-year time interval since exposure to war events [22].

As for longitudinal studies in Kosovar Albanian samples, we are aware of a single study assessing PTSD, depression and sense of coherence using the General Health Questionnaire and Hopkins Symptom Checklist. A total of of 402 subjects as samples were first interviewed at baseline and at 3 and 6 months while staying in Sweden as refugees [23, 24]. An additional follow-up conducted 1.5 years later in Sweden and Kosovo showed that subjects who remained in Sweden became more depressed and showed a higher rate of PTSD than those who returned to Kosovo. Longer-term outcome, combining physical and mental dimensions of health regarding war-exposed civilians who repatriated or remained in Kosovo remains largely undocumented.

The present follow-up study focuses on a cohort of Kosovar Albanians initially surveyed in 2001, 2 years after the end of the conflict, and re-interviewed in 2007. Main objective was to document changes in PTSD frequency and perceived physical and mental health over the 6-year follow-up period. Our hypothesis was that a decrease of PTSD frequency would be observed and accompanied by improvement of perceived mental health, even though symptoms may persist for many years after trauma [25]. We also investigated determinants of persistent, chronic PTSD as well as factors associated with newly observed, delayed-onset PTSD in a post-war context.

Method

Setting

Following decades of inter-ethnic tensions, the regional special autonomous status of Kosovo within the province of Serbia in the Federal Republic of Yugoslavia was drastically reduced in 1989, under the Milosevic government. During the 1990s the political situation worsened with increasing cultural oppression and repression against ethnic Albanians, who make up a majority of the population. By 1998, the conflict turned into a guerrilla war, resulting in more than one million displaced civilians. Events culminated with the NATO (North Atlantic Treaty Organization) bombing, which ended on June 10, 1999. An estimated 45.7% of the Kosovar Albanian population had fled Kosovo during the bombings and over 1.5 million managed to return to their homes to date. After the end of the conflict and under the United Nations administration that followed, ethnic tensions and harsh living conditions persisted, despite political efforts toward reconciliation and several ongoing reconstruction programs. On February 17, 2008, the Parliament of Kosovo declared independence. The population is now about 2.2 million, made up of approximately 90% ethnic Albanians and 50% under the age of 25. Unemployment rate is estimated to be about 40% in the working-age population [26].

Survey design

Design of the initial 2001 cross-sectional survey has been described earlier [5]. Briefly, 319 ethnic Kosovar Albanian households from eight municipalities were randomly selected from a list of families that included at least one person who had sought asylum in Switzerland and returned to Kosovo by April 2001, with the aid of the Swiss Development Agency and the International Organization for Migration (IOM). This first survey included 996 people aged 16 and older, of which 79.7% had temporarily left Kosovo during the war, and 20.3% had stayed throughout the conflict in their place of origin. The survey was conducted during September and November 2001 in Kosovo, with the technical support of IOM [5].

The follow-up study was conducted during September and October 2007 in Kosovo. IOM local staff located 250 households (78.4%) and 551 (55.3%) people from the 2001 sample who accepted to participate. Table 1 provides detailed information about respondents to the 2001 survey and their status with respect to the 2007 survey. Among respondents to the 2007 survey, 21.8% had stayed in Kosovo, 57.0% had sought temporary asylum in Switzerland and 21.2% had left to other European countries during the conflict in the late 1990s.

For both surveys, interviewers were recruited among local psychosocial counselors and specifically trained by the authors. Interviewers had either Kosovar or Bosnian backgrounds. Emphasis was given to research ethics and confidentiality issues. Questionnaires were examined and discussed. Role-playing was used as a pedagogic method for conducting the interviews and recognition of potentially distressed subjects. An interpreter was present throughout the training sessions. For the 2007 survey, 15 interviewers were hired and seven pairs were constituted for onsite visits.

Table 1 Status in 2007 of respondents to the 2001 Kosovo survey ($N = 996$)

Status in 2007	Frequency	%
Included in the 2007 survey	551	55.3
Household not retrieved	132	13.3
Absent from household	282	28.3
Not at home at the moment	134	13.5
Moved elsewhere in Kosovo	44	4.4
Moved abroad	74	7.4
Not specified	30	3.0
Died	26	2.6
Excluded for inconsistent data	5	0.5

Ethics

In the absence of a local ethics committee in Kosovo at the time the study was designed, we asked and obtained approval from the Ethics Committee of the Geneva University Hospitals. When a phone number was available, households were first orally informed of the follow-up health survey by the IOM medical service. All households were sent a one-page letter written in the Albanian language, with information about the study objectives, topics, duration of interviews (approximately 1 h per person) and conditions (participation on a voluntary basis, confidentiality, and financial compensation of 30 EUR per household). Before the interview, the information was provided again orally to each individual participant. Oral consent was obtained before proceeding with the questionnaires. Interviews took place in private with one of the two surveyors. Only people aged 16 or older and without any obvious impairment of their capacity of judgment were included. Interviewers were aware that if acute mental distress was observed, participants would have to be referred to local primary health care centers.

Instruments

Posttraumatic stress disorder in the past month was assessed with the appropriate section of the Mini Neuropsychiatric Interview (MINI) [27]. The MINI is a structured diagnostic interview designed conjointly in the United States and Europe to assess psychiatric diagnoses according to DSM-IV [28] and ICD-10 [29] criteria. Whereas the MINI had been locally translated in the Kosovar Albanian language in 2001 under the supervision of the authors, the 2007 survey used a published translation by Morina, not yet available in 2001 [30]. Differences between the two versions were minor. The translation by Morina was also used for major depressive episode (MDE) in the past 2 weeks, which was not investigated in 2001.

Self-perceived physical and mental health status was assessed using the Albanian translation of the Medical Outcomes Study 36-Item Short Form Health Survey (SF-36) [31]. SF-36 components were computed according to a 3-step procedure [32]. Items were first recoded and aggregated into eight scales using a 0–100 scoring algorithm. Scales were then standardized based on 1998 US population norms (z-transformation). The two summary scores (PCS, Physical Component Summary Score; MCS, Mental Component Summary Score) were calculated from these eight z-transformed scales, using factor score coefficients derived from the US sample. Finally, all scores were multiplied by 10 and added to 50 (norm-based scores), so that values 10 points below or above 50 represent differences of one standard deviation from the US average. This standard

scoring algorithm, recommended for multinational studies as well [33], was carefully checked against the online calculator freely available from the SF-36 developers (http://www.sf-36.org/nbscalc/index.shtml, last accessed June 11, 2009). The SF-36 has been extensively validated and used in many countries and cultures, including the post-war Balkans region.

Traumatic events possibly experienced between 2001 and 2007 were assessed using the first part of the Harvard Trauma Questionnaire (HTQ). The HTQ, composed of four sections, is a reliable screening instrument originally developed for measuring torture, trauma, and PTSD symptoms in culturally different populations [34]. A list of stressful life events, adapted from the Social Readjustment Rating Scale [35], was also included.

Because of a high percentage of illiteracy, especially in rural areas, interviewers were instructed to read all questionnaires aloud and to give additional explanations when necessary.

Data analysis

Independent groups were compared using the chi-square test for proportions. Comparison of PTSD prevalence in 2001 and 2007 proceeded with the McNemar test for change. Factors possibly associated with persistent PTSD from 2001 to 2007 were investigated with logistic regression models, adjusted for sex, age group (3 categories) and education (3 categories). Adjusted odds ratios (OR) and 95% confidence intervals (95% CI) were estimated independently for each traumatic or stressful life event. Factors associated with newly developed PTSD between 2001 and 2007 were investigated with a similar approach. Changes in SF-36 dimensions between 2001 and 2007 were investigated using mixed models, where time was considered as a within-subject effect and sex and age group (10-year intervals) were entered as fixed factors. These models allowed for estimating change over time, after adjusting for change attributable to aging during the follow-up period. SF-36 dimensions in 2007 were analyzed with respect to PTSD diagnosis using linear models adjusted for sex and age group (10-year intervals). Statistical data were computed using SPSS version 17 (SPSS Inc., Chicago, IL, USA). All tests were two-tailed with significance level at 0.05.

Results

Socio-demographic characteristics of survey participants

Of 996 subjects surveyed in 2001 [5], 551 (55.3%) living in 250 different households participated in 2007. Median number of participants per household was two (range 1–7). Comparison of subjects included in the 2007 survey with those absent from household at the time of the survey indicated that the surveyed sample was over-represented with respect to female gender, age $\geq$35 and lower education (Table 2). The study sample also differed from the sample not retrieved in 2007 with respect to rural versus urban municipalities, with over-representation of rural areas (Deçan, Gjakovë, Gjilan, Rahovec or Ferizaj) in the 2007 sample.

Socio-demographic characteristics in 2007 are summarized in Table 3. A majority of participants were female (56.6%), aged under 50 (66.6%), had educational level up to primary school (66.7%) and lived in mainly rural municipalities (65.5%). Unemployment rate was 25.3%.

PTSD and MDE diagnoses

In respondents to the 2001 and 2007 surveys, overall prevalence of PTSD, as diagnosed with the MINI, was 23.2% in 2001 to 14.5% in 2007 (McNemar test for change, $p < 0.001$). While the majority of subjects (67.5%) never met diagnostic criteria for PTSD, 5.3% had persistent PTSD from 2001 to 2007, 18.0% remitted and 9.3% developed PTSD between 2001 and 2007. Among participants with PTSD in 2001, remission rate in 2007 was 77.3%. Among participants without PTSD in 2001, incidence rate during the 6-year follow-up was 12.1%.

Overall prevalence of MDE was 36.7% in 2007. MDE diagnosis was significantly associated with PTSD, with prevalence of 80.0% (64 of 80 subjects) and 29.3% (138 of 471) among subjects with and without PTSD in 2007 (chi-square test, $p < 0.001$). Prevalence of MDE was 50.8% and 32.4% among subjects with and without PTSD in 2001 (chi-square test, $p < 0.001$).

Associations between socio-demographic characteristics and PTSD and MDE diagnoses in 2007 are presented in Table 3. PTSD and MDE diagnoses were significantly associated with female gender and age $\geq$50, whereas the association with lower education was significant for MDE only. For both diagnoses, differences were observed across municipalities, the lowest rates being observed in the urban areas of Prishtinë and Prizren.

When focus was placed on the 26 subjects who died between 2001 and 2007 (76.9% were $\geq$50 years old), PTSD prevalence according to 2001 data was particularly high ($n = 12$, 46.2%). However, the association between PTSD in 2001 and mortality did not reach statistical significance after adjusting for age (logistic regression, OR = 2.2, $p = 0.061$).

Exposure to traumatic and stressful life events since 2001 and association with PTSD

During the 2001–2007 post-war period, the most frequently endorsed traumatic event was ill health without access to

Table 2 Socio-demographic characteristics of respondents and non-respondents to the 2007 survey

Characteristic	Included in 2007 survey ($N = 551$)		Household not retrieved in 2007 ($N = 132$)			Absent from household in 2007 ($N = 282$)		
	Frequency	%	Frequency	%	p value[a]	Frequency	%	p value[b]
Gender								
Female	312	56.6	79	59.8	0.57	126	44.7	0.001
Male	239	43.4	53	40.2		156	55.3	
Age in 2001								
16–34	262	47.5	71	53.8	0.43	225	79.8	<0.001
35–49	160	29.0	33	25.0		32	11.3	
≥50	129	23.4	28	21.2		25	8.9	
Education in 2001[c]								
Less than primary	121	22.0	27	20.6	0.09	24	8.6	<0.001
Primary	271	49.4	54	41.2		136	48.7	
Higher than primary	157	28.6	50	38.2		119	42.7	
Unemployed in 2001	177	32.1	46	34.8	0.62	125	44.3	0.001
Municipality[d]								
Deçan/Decani	105	19.1	2	1.5	<0.001	48	17.0	0.20
Gjakovë/Djakovica	82	14.9	16	12.1		34	12.1	
Gjilan/Gnjilane	29	5.3	21	15.9		23	8.2	
Rahovec/Orahovac	74	13.4	6	4.5		40	14.2	
Pejë/Pec	48	8.7	20	15.2		34	12.1	
Prishtinë/Pristina	59	10.7	34	25.8		22	7.8	
Prizren/Prizren	83	15.1	21	15.9		36	12.8	
Ferizaj/Urosevac	71	12.9	12	9.1		45	16.0	

[a] Chi-square test for the comparison of subjects included versus not retrieved in 2007

[b] Chi-square test for the comparison of subjects included versus absent from household in 2007

[c] Missing values ($N = 6$)

[d] Names of municipalities in Albanian and Serbian (A/S)

medical care (31.2% of participants), followed by lack of food or water (19.6%), being close to death (13.6%) and lack of shelter (12.0%). Most frequently cited stressful life events were death of a close family member (36.3%), major change in financial conditions (20.7%), pregnancy or childbirth (19.2%), major change in responsibilities at work (18.5%), son or daughter leaving home (12.7%), and death of a close friend (12.3%).

Events associated with PTSD persistence from 2001 to 2007 are presented in Table 4. Ill health without access to medical care and major changes in responsibilities at work were the only events significantly associated with persistent PTSD, after adjusting for sex, age, and education.

Traumatic events significantly associated with new occurrences of PTSD in the 2001–2007 period included lack of food or water, ill health without access to medical care, lack of shelter, being close to death, and murder of family or friend (Table 4). Stressful life events associated with newly diagnosed PTSD included death of a close friend and major changes in financial conditions, responsibilities at work and working hours or conditions.

Perceived mental and physical health

Perceived health scores according to SF-36 dimensions are presented in Table 5. All scores were below 1998 norms for the US general population. Between 2001 and 2007, scores significantly improved for physical functioning, vitality, social functioning, and mental health, while the role physical dimension slightly deteriorated. Regarding summary scores, the physical component summary did not change significantly, while the mental component summary significantly improved (mean difference +4.5 points, $p < 0.001$). All analyses were adjusted for sex and aging during the observation period.

People with PTSD displayed significantly lower scores on both the physical component summary (mean difference −7.2 points, $p < 0.001$) and the mental component summary (mean difference −11.4, $p < 0.001$).

Table 3 Association between socio-demographic characteristics, PTSD and MDE diagnoses in 2007 ($N = 551$)

Characteristic	*N*	PTSD diagnosis			MDE diagnosis		
		Frequency	%	*p* value[a]	Frequency	%	*p* value[a]
Gender							
Female	312	54	17.3	0.045	128	41.0	0.019
Male	239	26	10.9		74	31.0	
Age in 2007							
16–34	169	22	13.0	0.005	44	26.0	<0.001
35–49	198	19	9.6		72	36.4	
≥50	184	39	21.2		86	46.7	
Education in 2007[b]							
Less than primary	123	24	19.5	0.052	57	46.3	0.003
Primary	243	38	15.6		94	38.7	
Higher than primary	183	18	9.8		51	27.9	
Unemployed in 2007[b]							
Yes	139	20	14.4	1	48	34.5	0.66
No	410	59	14.4		152	37.1	
Municipality[c]							
Deçan/Decani	105	20	19.0	0.032	35	33.3	<0.001
Gjakovë/Djakovica	82	15	18.3		36	43.9	
Gjilan/Gnjilane	29	6	20.7		17	58.6	
Rahovec/Orahovac	74	10	13.5		23	31.1	
Pejë/Pec	48	10	20.8		22	45.8	
Prishtinë/Pristina	59	7	11.9		16	27.1	
Prizren/Prizren	83	2	2.4		18	21.7	
Ferizaj/Urosevac	71	10	14.1		35	49.3	

[a] Chi-square test

[b] Missing values ($N = 2$)

[c] Names of municipalities in Albanian and Serbian (A/S)

Discussion

Most longitudinal studies of mental health in war-affected civilian populations focused on refugees, either in refugee camps, in neighboring countries, or in Western countries of asylum. Moreover, most studies conducted in post-war settings took place over limited periods, usually between 6 months and 2 years, because of political and economic instability, changes in infrastructure, financing health policies, international priorities, or other organizational reasons. To our knowledge, this is the first study that focused on civilians in their place of origin more than 5 years after the end of the conflict, documented change in perceived physical and mental health, and investigated the determinants of PTSD persistence or new occurrence within a 6-year time interval.

About 8 years after the end of the Kosovo conflict, prevalence of PTSD and MDE diagnoses were 14.5% and 36.7%, respectively. Comorbidity of MDE and PTSD was observed in 11.6% of participants, with 80.0% of subjects with PTSD meeting diagnostic criteria for MDE as well. This observation is consistent with the study by Kashdan et al. [6] in Kosovo, which found that 65% of subjects with PTSD had major depressive disorder (MDD), as compared with 33% of subjects without PTSD. In addition, our study suggests a long-lasting association between depressive and posttraumatic stress symptoms. Indeed, participants with PTSD in 2001 showed more frequent MDD in 2007 (50.8%) than those without PTSD (32.4%).

Female sex, older age, and low education level were factors associated with PTSD and MDE diagnoses in 2007, in accordance with available literature. Kimhi et al. mentioned that in most studies females reported higher levels of war-related stress and that low economic condition was associated with increased vulnerability to stress. They hypothesized that economic conditions might be of major concern with respect to the long-term impact of war. They also argued that older individuals might be more vulnerable to PTSD symptoms and that postwar adverse responses could be more prevalent and more enduring among older people [36]. Interestingly, we observed a slightly higher

Table 4 Events associated with PTSD persistence or incidence between 2001 and 2007

	PTSD present in 2001 ($N = 126$)				PTSD absent in 2001 ($N = 423$)			
	Frequency	%	PTSD persistent in 2007 ($N = 29$, 23.0%)		Frequency	%	PTSD first diagnosed in 2007 ($N = 51$, 12.1%)	
			OR[a]	95% CI			OR[a]	95% CI
Traumatic events since 2001								
Lack of food or water	32	25.4	1.9	0.7–5.3	76	18.0	4.3	2.3–8.4
Ill health without access to medical care	63	50.0	6.5	2.2–19.0	108	25.5	8.9	4.5–17.4
Lack of shelter	17	13.5	2.3	0.8–7.1	49	11.6	5.7	2.8–11.6
Imprisonment	0	0.0	NT		5	1.2	NT	
Serious injury	15	11.9	1.5	0.4–4.9	29	6.9	2.4	0.9–6.4
Combat situation	3	2.4	NT		7	1.7	NT	
Sexual abuse	0	0.0	NT		2	0.5	NT	
Forced isolation from others	6	4.8	NT		3	0.7	NT	
Being close to death	33	26.2	1.3	0.5–3.4	40	9.5	2.4	1.1–5.4
Forced separation from family members	1	0.8	NT		2	0.5	NT	
Murder of family or friend	10	7.9	2.4	0.6–9.7	14	3.3	6.5	1.9–22.5
Unnatural death of family or friend	14	11.1	2.8	0.8–10.0	28	6.6	2.1	0.7–6.2
Murder of stranger	7	5.6	NT		15	3.5	1.3	0.3–6.3
Lost or kidnapped	1	0.8	NT		0	0.0	NT	
Torture	2	1.6	NT		2	0.5	NT	
Stressful life events since 2001								
Death of spouse	5	4.0	NT		11	2.6	0	–
Death of a close family member	53	42.1	0.5	0.2–1.4	147	34.8	1.6	0.9–2.9
Death of a close friend	17	13.5	1.6	0.5–5.3	51	12.1	3.8	1.8–8.1
Marital separation, divorce	1	0.8	NT		7	1.7	NT	
Being fired from work	8	6.3	NT		19	4.5	1.3	0.3–6.5
Excessive debts	15	11.9	0.6	0.1–3.3	30	7.1	2.4	0.9–6.7
Marriage	4	3.2	NT		22	5.2	1.1	0.3–4.0
Son or daughter leaving home	28	22.2	2.2	0.8–6.3	42	9.9	0.8	0.3–2.2
Pregnancy or child birth	28	22.2	1.6	0.5–5.2	77	18.2	2.0	0.9–4.3
Major change in financial conditions	40	31.7	2.4	0.9–6.0	74	17.5	4.1	2.0–8.7
Major change in responsibilities at work	21	16.7	8.5	2.5–29.4	81	19.1	7.6	3.9–14.7
Major change in working hours or conditions	8	6.3	NT		25	5.9	4.5	1.5–13.1

[a] Logistic regression models adjusted for sex, age group, and education

NT not tested if frequency <10

rate of PTSD among young adults (16–34 years) compared with adults aged 35–49 (13.0 and 9.6%, respectively), possibly related with exposure to war events during adolescence.

A major finding of our follow-up study is the positive evolution of mental health outcome indicators. PTSD was significantly less prevalent in 2007 than it was in 2001. Whereas 5.3% of participants had persistent PTSD on both assessments, 18.0% had remitted and 9.3% had developed the disorder between 2001 and 2007. Improvement was also observed on SF-36 dimensions that encompass mental functioning, namely vitality, social functioning, and mental health. Scores on physical dimensions changed in inconsistent directions. Physical functioning improved, role physical slightly deteriorated while other dimensions remained unchanged between 2001 and 2007. The SF-36 mental health component summary score significantly improved ($+4.5$, $p < 0.001$) while the physical component summary score remained unchanged (-0.8, $p = 0.14$), after taking into account the decrease attributable to aging during the follow-up period. In a 5-year prospective study of SF-36 scores in a normative population, decline due to natural progression was shown to be more pronounced in the older age groups and in the physically oriented domains [37]. Estimated mean change in mental health component summary score was generally positive but small (≤ 2) in all

Table 5 Perceived health scores (SF-36) in 2007 and change with respect to 2001 ($N = 523$)

SF-36 dimensions[a]	2007 survey		Change with respect to 2001		
	Mean	95% CI	Mean difference	95% CI	p value
Physical functioning	44.6	43.7–45.6	4.0	2.7–5.3	<0.001
Role physical	42.8	42.0–43.6	−1.5	−2.4–−0.5	0.003
Bodily pain	43.2	42.0–44.4	−1.3	−2.7–0.0	0.054
General health	38.0	37.1–38.8	0.0	−1.0–1.0	1.00
Vitality	47.1	46.1–48.0	2.7	1.6–3.9	<0.001
Social functioning	40.4	39.3–41.6	2.8	1.4–4.2	<0.001
Role emotional	43.8	42.9–44.7	0.5	−0.5–1.6	0.29
Mental health	39.3	38.1–40.5	7.2	5.8–8.5	<0.001
Physical component summary (PCS)	43.6	42.8–44.5	−0.8	−1.9–0.3	0.14
Mental component summary (MCS)	41.8	40.8–42.8	4.5	3.4–5.6	<0.001

[a] Norm-based scores, using normative data from the 1998 US general population (mean = 50, SD = 10), adjusted for sex and age group

gender and age categories, suggesting that the MCS increase in the present study might represent a clinically relevant change.

Reduction of PTSD prevalence with time is in accordance with what is known about the epidemiology of the disorder. It is usually accepted that the mean duration of symptoms in untreated PTSD is 5 years [38]. In contrast, recent studies conducted in former Yugoslavia (Croatia, Serbia and Bosnia-Herzegovina) have shown that people with untreated war-related PTSD have a high risk of still having PTSD a decade after the traumatic event [22] and that recovery rate among patients treated in specialized centers for war-related PTSD several years after the war is poor (no more than 14%) [39].

From other settings, it is known that somatoform symptoms are more prevalent in traumatized patients [40] and that PTSD is associated with a higher rate of general medical complaints [41]. PTSD was indeed associated with lower perceived physical health in the present study. It might be postulated that unmet needs for medical care might have played a role in the non-improvement of physical health. Ill health without access to medical care was endorsed by 31.2% of participants in the 2007 survey and 35.4% in 2001 [1]. Possibly related with the poorly coordinated health system in post-war Kosovo [42], ill health without access to medical care was identified as a major factor associated with both persistence and incidence of PTSD (OR estimates >6). The literature indicates that a history of PTSD or exposure to psychological trauma might not only be associated with medical morbidity but also with increased mortality [43]. Because of limited statistical power, the present study, however, did not allow documenting significantly increased mortality in subjects diagnosed with PTSD in 2001, after adjusting for age.

Despite the fact that the armed conflict officially ended in 1999 with the placement of Kosovo under transitional United Nations administration, interethnic tensions persisted. In 2004 particularly, Kosovo experienced a series of minor events that soon cascaded into large-scale riots. It was therefore interesting to examine not only the traumatic events, but also more ordinary stressful life events that occurred in the 2001–2007 period. Indeed, sub-threshold trauma exposure can trigger symptoms in sensitized individuals [44] and the cumulative effect of traumatic events on PTSD, also called "dose-effect phenomenon", has been well documented [45]. Some potentially traumatic events, which were relevant in the 2001survey [5], did not occur thereafter, or at very low frequencies (e.g. imprisonment, combat situation, sexual abuse, forced isolation or separation, witnessing murder of a stranger, being kidnapped or tortured). Other potentially traumatic events, some of them linked to civilian accidents or poverty, were more frequently reported. As indicated earlier, ill health without access to medical care was the most frequently cited traumatic event, associated with both persistence and incidence of PTSD. Other traumatic events associated with incidence of new cases had to do with poverty and country destruction (lack of food or water, lack of shelter). Among stressful life events, major changes in responsibilities at work (e.g. promotion, demotion, lateral transfer or changing from one job to another) were strongly associated with both non-remission and incidence of new PTSD cases.

It can be estimated that 140,000 to 200,000 people in Kosovo (between 7 and 10% of the population) might suffer from PTSD [46]. The current capacities of the mental health sector in Kosovo, made of eight outpatient mental health facilities and five community-based psychiatric inpatients units offering 8.7 beds per 100,000 people, are insufficient. Human resources are lacking, and, historically, Kosovar psychiatry is oriented towards biological approaches, which have a limited impact on PTSD symptoms when not associated with relational

(psychotherapeutic) treatments. Access to care is limited. The public health insurance system does not function properly and private clinics are unaffordable by the majority of the population. Moreover, ongoing ethnic tensions perpetuate segregation in the health care system, some minorities such as the Roma being excluded from the system [47]. Results from the present study therefore underline the necessity to take into account the needs of people with PTSD and MDE in the ongoing health care reforms in Kosovo. Women, elderly people, and persons with lower educational level might particularly benefit from improved access to mental and physical health care facilities.

Limitations

A number of limitations need to be mentioned. First, despite efforts to locate households and retrieve family members, the follow-up rate between 2001 and 2007 was only 55%. It is important to take into account the specific context of such a study. In post-war settings, the vast majority of surveys are cross-sectional or with short follow-ups, precisely because of logistic difficulties. Kosovo, like other post-war regions, was poorly organized, lacking transportation infrastructure and rapidly changing in terms of social institutions and migratory patterns at the time of the survey. Thanks to the lasting collaboration between the research team and resources available locally, these problems were partly overcome. It is tempting to assume that non-included people were healthier than participants, since a majority that were absent from household (momentarily occupied with outside duties, or having moved elsewhere in Kosovo or abroad) were younger, and more educated. This would imply a bias toward underestimation of health outcome in the present sample. Second, the present sample was not expected to be representative of the general population in Kosovo. All households included in the 2001 survey had been assisted by IOM prior to 2001 and former asylum seekers were over-represented [5]. The influence of leaving Kosovo during the conflict and living conditions during asylum on health components have been described following the 2001 survey [48]. Even though some longer-term influence of asylum cannot be excluded, 2007 data rather suggested that more recent traumatic events and/or stressful life events might be major determinants of present health status. Third, adjustment disorders (AD) were not assessed, although PTSD and AD could be parts of a stress response spectrum in post-conflict settings [49]. Fourth, our approach toward PTSD and MDE was categorical rather than dimensional. According to the MINI, the detailed symptom list is skipped in the absence of an extremely traumatic event and distressing re-experience of the event, so that sub-threshold cases are not taken into account. It is probable that sub-threshold PTSD in 2001 might have accounted for some PTSD cases first diagnosed in 2007, in keeping with a review article indicating that delayed-onset PTSD often represents exacerbations or reactivations of prior symptoms [50]. The use of psychometric instruments also implied a quantitative rather than qualitative methodology; local representations of health, illness, and suffering were not recorded. In addition, minor differences between the 2001 and 2007 Albanian versions of the MINI need to be mentioned, although influence on results appears unlikely. Finally, statistical power was limited to investigate the combined effect of different predictors on PTSD persistence and new occurrence, which were observed in small subsamples.

Conclusions

The present 6-year follow-up study of Kosovar Albanians living in their place of origin revealed contrasted results. While mental health globally improved over time, subjective physical health remained unchanged. Ill health without having access to medical care was reported by about one-third of participants. It was strongly associated with persistence of PTSD from 2001 to 2007 and contributed to the occurrence of new PTSD cases, together with other traumatic and stressful events. These results point at the importance of economic and health system reconstruction programs in post-conflict countries taking into account the long-lasting intricate relationships between physical health dimensions and PTSD and depressive symptoms.

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